

A Superconducting Undulator for Advance Light Sources

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The Advance Light Source (ALS) facility at LBNL is proposing to build a superconducting undulator that produces a 1 T field over a 20 mm period. One possible novel design is based on superposed fields generated by helical windings around a rectangular form. Each layer is proposed to be bifilar wound from a single superconducting strand with an alternating pitch between layers. The alternating pitch, "right-hand" and "left-hand", between layers produces an overall linear undulating field. The design utilizes the simplicity of helical windings, with a single superconducting strand over the entire magnet with no internal joints. Finally, to enhance the field, we have incorporated ferromagnetic iron in the pole regions and propose to use it for possible minor field adjustments.

This paper describes the magnetic concept, the winding scheme, and reports the field analysis and harmonic calculations.

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